

exceptional character, the author feels strongly impressed with the belief that its effect has possibly been to give increased rigidity and immobility to the flexible crust of the earth, and to produce a state of equilibrium which might otherwise have been of long and slow attainment, whereby it has been rendered fit and suitable for the habitation and pursuits of civilized man*.

ZOOLOGICAL SOCIETY.

February 11, 1862.—Dr. J. E. Gray, V.P., in the Chair.

DESCRIPTION OF SOME NEW SPECIES OF SPOGGODES AND OF A NEW ALLIED GENUS (MORCHELLANA) IN THE COLLECTION OF THE BRITISH MUSEUM. BY DR. J. E. GRAY, F.R.S., V.P.Z.S., F.L.S., ETC.

The genus *Spoggodes* was established by Lesson on a coral that was described by Esper under the name of *Alcyonium floridum*. It is characterized by the whole of its substance being membranous, very loosely cellular within, and covered externally with a layer of fusiform spicula which are most abundant round the cells.

M. Milne-Edwards, in his 'Coralliaires,' only describes a single species.

The species of the genus in the British Museum may be divided into two groups or subgenera.

I. *The polypes crowded together at the end of the branchlet, and the groups more or less surrounded by larger spicula of the branchlet.* Spoggodes.

1. SPOGGODES FLORIDA.

The coral pale purplish-red (in spirits); stem thick, much branched, strengthened with very slender elongate purple spicules; the branchlets short, clustered at the end of the branches, and forming convex heads or cells; cells fringed with the very slender elongated spicules, and furnished with white, only partially contracted polypes.

Alcyonium floridum, Esper, Pflanz. iii. 49, *Alcy.* t. 16, dry.

Xinia purpurea, Lamk. Hist. A. s. V. ii. 401, from Esper.

Neptea florida, Blainv. Man. Act. 523, from Esper.

Spoggodes celosia, Lesson, Ill. Zool. t. 21; M.-Edwards, Coralliaires, i. 129, t. B 1. f. 1.

Spoggodea celosia, Dana, Zoophytes, 626, t. 59. f. 4.

Hab. Australia; Sharks' Bay (Mr. Rayner); Philippine Islands (H. Cuming, Esq.).

* In this and his former paper the author has used the term "pleistocene" in the sense of post-pleiocene, including also some beds placed in the newer pleiocene.

2. SPOGGODES SPINOSA.

The coral whitish, forming roundish spinose masses; the stem thick, slightly branched, with very numerous short branchlets; the spicules white, very unequal, some large and thick; the terminal branchlet furnished, on the inner upper edge, with curved (in spirits) partly retracted purple polypes, which are surmounted and protected by the large opaque-white spicules of the branchlets.

Hab. New Guinea.

This species is easily distinguished by the large size and opaque-white colour of the spicula and the purple colour of the polypes.

II. *The polypes isolated in the prominent isolated spiculose sub-cylindrical cells, scattered on the sides, or forming tips of the branchlets.* Spoggodia.

3. SPOGGODES UNICOLOR. (Woodcut, figs. 1, 2.)

The coral uniform pale yellowish (in spirits); the spicules very slender, whitish yellow; stem erect; branches scattered in all directions, spreading, tapering, with few short tapering branchlets; cells distinct, distant, spreading, subcylindrical, sometimes very slightly contracted at the base; mouth surrounded by five or six unequal prominent spicules, the one on the outer side of the cell being generally the longest; polypes retractile.

Hab. Bellona Reefs, in 17 fathoms (*Rayner*).

4. SPOGGODES DIVARICATA. (Woodcut, figs. 3, 4.)

Coral pale whitish (in spirits); stem thick, slightly branched, with very numerous crowded ramuli forming roundish lobes; the ramuli divided at the top into three or five diverging cylindrical cells; the cells of the several branchlets forming a sort of roundish-topped cyme; polypes contracted (in spirits), rose-coloured.

Hab. New Guinea (*Capt. Sir Edward Belcher, R.N., C.B.*).

5. SPOGGODES RAMULOSA. (Woodcut, figs. 5, 6.)

The coral dark brown-red (in spirits); stem thick, much branched, strengthened by slender, elongated-fusiform, dark-brown-red spicules; the branchlets numerous, elongate, slender, much branched, with the cells scattered on their sides; cells distant, subcylindrical, and fringed on the edge with unequally prominent spicules, the outer spicules being generally the longest and most prominent; the polypes pale yellowish, being generally nearly contracted into the cells, rarely prominent.

Hab. Bellona Reefs, at 17 fathoms.

Some of the polypes on the lower part of the branchlets seem to be somewhat crowded. This species is easily known from *S. florida* and *S. unicolor* by the general colour of the coral and by the slenderness and length of the branchlets. It agrees with the former in the coral and spicules being red, and the polypes being more or less prominent and of a different colour from the coral, and with the latter

in the form of the cell; but the cells are very differently disposed, and of a slender, attenuated form.



We have in the British Museum a new form of the “Alcyoniens armés” of M. Milne-Edwards (*Coralliaires*, vol. i. p. 127), which, in my idea, form a family that may be called *Nepthyadæ*.

This coral differs from the three genera of this family mentioned

by Milne-Edwards, in the lower part or stem being coriaceous and destitute of any spicules, and in the upper part being spiculose, and furnished with short clusters of polype-cells, giving it much the appearance of the *Fungi* called *Morchella* and *Helvella*.

MORCHELLANA.

The coral subclavate, coriaceous, subcalcareous, and loosely cellular



within; the stem subcylindrical, elongate, hard, coriaceous, and minutely granular on the surface.

The head formed of numerous, irregularly dispersed, short-lobed prominences, which are covered at the end with diverging conical prominent polype-cells,—the lobes and cells being strengthened with superficial fusiform spicules, slightly covered with the skin of the coral; the polypes entirely retractile.

The whole substance of the coral is loosely cellular, and the lobes of the head are brittle and easily broken off when in spirits. The base of the stem is furnished with some large tubular fibres, which seem to act as roots to attach it to rocks.

The spicules on the edge of the polype-cells are rugulose or spinulose.

MORCHELLANA SPINULOSA. (Woodcut, p. 72.)

Hab. Indian Ocean.

NOTES ON SOME SPECIMENS OF CLAVIFORM PENNATULIDÆ (VERETILLEÆ) IN THE COLLECTION OF THE BRITISH MUSEUM. BY DR. JOHN EDWARD GRAY, F.R.S., V.P.Z.S., F.L.S., &c.

Since my paper, entitled “Revision of the Family *Pennatulidæ*, with description of some New Species in the British Museum,” was printed in the ‘Annals and Magazine of Natural History’ for January 1860, we have received several specimens of club-shaped Sea-Pens (*Veretilleæ*) which further illustrate the species of this group.

Professor Milne-Edwards, in the first volume of his ‘Coralliaires,’ published in 1857, divides the *Claviform Pennatulæ* into three genera, thus—

1. LITUARIA, with a distinct, well-developed, quadrangular central stony axis.
2. VERETILLUM, with a rudimentary hard central axis.
3. CAVERNULARIA, without any hard central axis, but with four large longitudinal central cells.

Dr. Herklots, in his “Monograph of the *Pennatulidæ*,” in the ‘Bijdragen tot die Dierkunde’ for 1858, divides them into four genera, adding the genus *Sarcobelemnon* to the above list. The species of *Lituaria* and *Sarcobelemnon* are found in the Indian and Australian Oceans, and those of *Veretillum* and *Cavernularia* are confined to the Mediterranean.

The *Veretilleæ* in the British Museum appear to belong to only two genera, viz.—

1. VERETILLUM. The club with a short thick base, with four more or less large longitudinal cells in the centre.
2. LITUARIA. The club with an elongated base, and with a strong, subquadrangular, central, more or less stony axis.

The former group seems to be synonymous with the genera *Vere-*
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tillum and *Cavernularia* of Milne-Edwards and *Sarcobelemnon* of Herklots. I call the first genus by the name *Veretillum*, because I find that the specimen of *Pennatula Cynomorium* which we have in the British Museum does not appear to have any rudiment of an axis, and has the four large longitudinal cavities in the centre of the coral which are described as characteristic of *Cavernularia* and *Sarcobelemnon*. Can the septa between these cells have been considered as the rudimentary axis?

VERETILLUM.

The pen club-shaped, with a short, thick, fleshy base ; the upper part of the club short and thick, or more or less tapering, covered with close longitudinal rows of polypes ; the interspaces between the polypes marked with very close, opaque, imbedded granules ; the opening of the polype-cells, when contracted, transverse ; the middle of the coral furnished with four quadrangular tubes, and without any hard central axis.

1. VERETILLUM CYNOMORIUM.

Veretillum Cynomorium, Pallas, Spic. Zool. t. 13. f. 1-4.

We have a single specimen of this species in the British Museum, which I believe is the specimen described by Ellis, on the Sea-Pens, as *Cynomorium* (Phil. Trans. 1765, vol. liii. 434, t. 13. f. 3) ; for it has the label on it, written by my late uncle who died in 1806, like the label on the specimen of *Siren* which was presented by Ellis. It certainly has no appearance of any hard central axis, unless the rather hard septa between the central cells may be considered as an axis ; if they are, then the same kind of axis is found in each of the other species which I have referred to this genus.

2. VERETILLUM AUSTRALASIÆ.

Sarcobelemnon Australasiæ, Gray, Ann. and Mag. N. H. 1860, v. 24, t. 4. f. 1.

The polypes far apart.

Hab. Australia ; Port Essington (*J. B. Jukes, Esq.*).

This specimen chiefly differs from the *V. Cantoriæ* in the substance of the coral being harder, and in the cells of the polypes being further apart and more scattered, not appearing to be placed in such regular and close longitudinal rows. The specimen seems to have been placed in very strong spirits when first collected, as almost all the polypes are retracted, and the base of the club is wrinkled, as if strongly contracted, and the cavities in the axis are smaller ; but all this may have been produced by the sudden and great contraction of the animal at the time it was preserved.

3. VERETILLUM CANTORIÆ.

Cells of polypes close together, in regular longitudinal series.

Hab. Penang (*Dr. Cantor*).

We have a large series of specimens of this species from Penang,

where, I am told, they are collected for food. They differ exceedingly from each other; and if they are all of the same species, as I suspect is the case, it shows how difficult it is to give a character that shall define the species of the genus. Some are short, thick, oblong, rounded at each end, varying from $2\frac{1}{2}$ to 3 inches long, with a short thick base to the club of about half an inch long. In most of the specimens of this form, the polypes are retracted; but in one, some of them are expanded.

In the second group the club is much larger, varying from 3 to 7 or 8 inches long, and is attenuated upwards. The base of the club is short and thick, as in the former group of specimens. The polypes are generally expanded; they are much more slender and more elongate than the polypes of *Lituarina australis*.

Probably the length and tapering form of these specimens may be dependent on their having been placed originally in weaker spirits. The size of the cavities or tubes in the specimens also differ; they are largest in the short broad specimens, but very distinct in all. I am therefore inclined to believe that there are only two distinct genera of the *Claviform* Sea-Pens.

LITUARIA.

The pen elongate, the upper part slender, tapering, with close longitudinal rows of polypes; the interspace between the polypes covered with close longitudinal rows of distinct circular pores; the opening of the polype-cells, when contracted, longitudinal; the lower part elongate, subcylindrical, smooth; the axis hard, stony, distinct, well developed, quadrangular.

The lower part of the coral, which is destitute of polypes, is elongate, often one-third and rarely nearly half as long as the upper polype-bearing portion of the club; the length of the stem, as compared with the club, appears to differ, within certain limits, in different specimens of the same species from the same locality, but it is always larger and more slender than the same part in the genus *Veretillum*.

The specimens of this genus in the British Museum appear to separate themselves into two very distinct groups, which may represent so many species, or may only depend on the manner in which the specimens have been preserved, or even on the strength of the spirit in which they were at first immersed.

In four specimens from Penang, collected by Dr. Cantor, which are slender and white, all the polypes are entirely contracted, leaving a compressed slit over the cell, except in one of the small specimens, in which a few of the polypes are partly exerted; they are pale brown. In one of the specimens the fleshy part of the base is thickened, and has contracted so much that the hard axis is exerted nearly an inch beyond the base. In this specimen the base of the club is much shorter and thicker than in the others. From this specimen I am led to believe that the length and slenderness of the club in the genus, when in spirit, is preserved by the rigidity of the internal axis. These specimens are probably the *Lituarina phalloïdes* of Milne-

Edwards (Coralliaires, vol. i. 217), founded on the *Pennatula phalloides* of Pallas (Misc. Zool. t. 13. f. 5, 6, 7, 8).

The second group of specimens were collected by Mr. Rayner in Sharks' Bay, Australia. They are three in number; they are softer and less contracted than the preceding; the pores on the surface are more distinct, and are furnished with more or less dark polypes, which are all expanded. The polypes in one specimen (which is in the most perfect condition) are all entirely of uniform black-brown colour. In one of the other specimens (also in good condition) the polypes are pale brown, with a broad black lower ring at the upper part of the tubular body, near the base of the arms. In the other specimen (which is imperfect) the polypes are all pale brown, like the coral.

In all the three specimens the polypes at the lower half of the club are further apart than they are at the tip; this is especially the case in the specimen which has the dark ring on the polypes, in which the polypes in the lower part of the club are very far apart and few in number, and appear as if placed in longitudinal lines. I should propose to call this species provisionally *Lituarina australis*.

MISCELLANEOUS.

On the Animal of Zonites excavatus, &c.

To the Editors of the Annals and Magazine of Natural History.

GENTLEMEN,—In the first volume of my work on 'British Conchology,' which contains an account of the Land and Freshwater Mollusca, *Zonites excavatus* is one of the very few species of which I could only give a meagre and unsatisfactory description of the animal. I am now fortunately enabled to supply this deficiency, having last week found and observed live specimens of the species in question near Tunbridge Wells; and this new locality will also be interesting to those who study the distribution of the British Mollusca.

Body slender, greyish white, with three or four raised lines along the neck: *mantle* closely covered with milk-white specks: *tentacles* diverging; upper pair rather long and cylindrical, coarsely granulated; lower pair short: *foot* thick, obtusely rounded in front, and gradually narrowing behind to an angular or keeled point. The slime is rather copious and iridescent.

In the same spot were *Zonites alliarius*, *Z. nitidulus*, *Z. purus*, *Z. radiatulus*, *Z. fulvus*, and *Helix rotundata*.

The pulsations of *Z. alliarius* varied within the space of ten minutes, having from 48 to 56 beats per minute.

I am, Gentlemen,

Yours faithfully,

J. GWYN JEFFREYS.

25 Devonshire Place, Portland Place,
June 4, 1862.